

velocity may be found in the theory of ventilation and these may be applied; but at the present time there is no series of observations which will permit the computation of the frictional losses.

Calculations by the author show that these frictional losses may be evaluated by the following expression:

$$\gamma = m \frac{SL}{co} V f p_t = \frac{m SL}{(A) co} \frac{B}{co} m \wedge q o p Q, \quad \therefore A.$$

in which y = millimeters of water column;

m = the coefficient of friction of the gas against the brick;

S = the perimeter of the channel in meters, or that

portion of the perimeter " wet " by the gas;

co = the cross-sectional area of the channel or stream of

gas in square meters;

L = the length in meters of the portion of the channel considered ;

$J3 = SZ/$ = the superficial wall area of the portion of the channel considered;

$\wedge$ = the velocity of flow of the stream of gas at the

temperature t° in meters per second ;

p_t = the weight in kilograms per cubic meter of the gas

at the average temperature f° ;

t° = the average temperature of the gas in the part of the channel considered;

go = the volume of the gas at 0° and 760 mm pressure;

po = the specific weight of the gas at 0° and 760 mm.

According to Professor Groume-Grjimailo, under the usual working conditions of metallurgical furnaces, the gases passing through the internal channel of these furnaces should always be considered with reference to the air which forms the external atmosphere, and the difference between the density of the hot gases and the air supplies the motive force for the flow of these gases; therefore, taking as the basis of comparison air at 0° and 760 mm which has a specific weight $po=1.29$ kg per cubic meter, it follows that if $Fo=1.0$ m per second and

$L=1.0$ m ,
the above formula becomes:

in which $y=m$ if $-o=1.293$. In other words, *the coefficient m is*